



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

$$\text{Let } \sqrt{r^2 + 4a^2} = 2y - r, \quad \frac{a}{2}(\sqrt{5} + 1) = y'.$$

$$\therefore \Delta = \frac{1}{8}\pi a^2 - \frac{1}{8}a^2 \sin^{-1}(\sqrt{5} - 2) + \frac{1}{3a} \int_a^{y'} \frac{(3y^2 + 3a^2 + 2ay)(y - a)^3 dy}{y^3 \sqrt{y}}$$

$$= \frac{1}{8}\pi a^2 - \frac{1}{8}a^2 \sin^{-1}(\sqrt{5} - 2) + \frac{1}{3a} \int_a^{y'} (3y\sqrt{y} - 7a\sqrt{y} + 6a^2/\sqrt{y} - 6a^3/y\sqrt{y})$$

$$+ 7a^4/y^2\sqrt{y} - 3a^5/y^3\sqrt{y}) dy = \frac{1}{8}\pi a^2 - \frac{1}{8}a^2 \sin^{-1}(\sqrt{5} - 2) + \frac{2}{45}a^2 [(86 - 13\sqrt{5})$$

$$\sqrt{\frac{\sqrt{5} + 1}{2}} - 128 + 11(11 - 2\sqrt{5}) \sqrt{\frac{\sqrt{5} - 1}{2}}].$$

Solved with a different result by the *PROPOSER*.

134. Proposed by G. B. M. ZERE, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

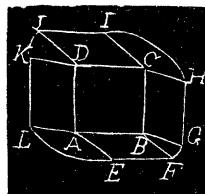
An ellipse, semi-axes  $a$ ,  $b$ , is placed on a square, side  $c$ . Find the chance that center of ellipse is on the square.

Solution by the *PROPOSER*.

Let  $ABCD$  be the square, and let the ellipse move parallel to itself so that the major axis makes an angle  $\theta$  with the side  $BC$ . Then the center of the ellipse will describe the area  $GHIJKLEFG$ .

Let  $(a^2 - b^2)/a^2 = e^2$ ,  $p = \text{chance}$ . The perpendicular distance from  $BC$  to  $GH = a\sqrt{1 - e^2 \cos^2 \theta}$ , the perpendicular distance from  $DC$  to  $IJ = a\sqrt{1 - e^2 \sin^2 \theta}$ .

$$\text{Area} = \pi ab + c^2 + 2ac [\sqrt{1 - e^2 \sin^2 \theta} + \sqrt{1 - e^2 \cos^2 \theta}] = u.$$



$$1/p = \int_0^{1/\pi} u d\theta / \int_0^{2\pi} c^2 d\theta = \frac{2}{\pi c^2} \int_0^{1/\pi} u d\theta. \quad \therefore 1/p = [\pi ab + c^2 + \frac{8ac}{\pi} E(e, \frac{1}{2}\pi)]/c^2.$$

$$\text{If } a=b, 1/p = (\pi a^2 + c^2 + 4ac)/c^2. \quad \text{If } a=b=c, 1/p = \pi + 1 + 4.$$

135. Proposed by LON C. WALKER, A. M., Graduate Student, Leland Stanford Jr. University, Cal.

If the line joining two points taken at random in the surface of a given circle be the diagonal of a square, the chance that the square lies wholly within the circle is  $2 - 4/\pi$ .

Solution by the *PROPOSER*.

Let  $MN$  be the line joining the random points  $M$ ,  $N$ ;  $MRNS$  the square;  $Q$ , its center;  $O$ , the center of the circle. Let the square move about the circle, so as to be within it, but in contact with it, the diagonal  $MN$  remaining parallel